**GPU Nuclear**

100 Interpace Parkway
Parsippany, New Jersey 07054
201 263-6500
TELEX 136-482
Writer's Direct Dial Number:

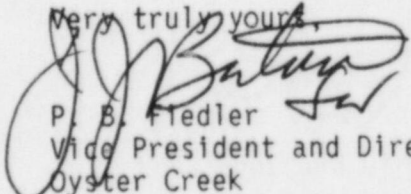
September 19, 1986

Mr. John A. Zwolinski, Director
BWR Project Directorate #1
Division of BWR Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Zwolinski:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Detailed Control Room Design Review (DCRDR)

In response to our conversation with your staff on July 22, 1986, please find attached the supplemental information requested relative to Attachment 2 of GPU Nuclear's May 19, 1986 submittal. With respect to "Control Room Inventory" and as indicated in our previous submittal, GPU Nuclear will compare the control room with the display and control requirements through Revision 4 of the BWR Owner's Group Emergency Procedure Guidelines (this includes Revision 3) to identify any additional instrumentation and control requirements.

Very truly yours,

P. B. Fiedler
Vice President and Director
Oyster Creek

PBF/JDL/pa(3747f)

cc: Dr. Thomas E. Murley, Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA. 19406

NRC Resident Inspector
Oyster Creek Nuclear Generating Station
Forked River, N.J. 08731

J. Donohew
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, Maryland 20014

8609250301 860919
PDR ADOCK 05000219
P PDR

of the General Public Utilities System

A003
11

ATTACHMENT

SELECTION OF DESIGN IMPROVEMENTS

This document contains supplemental information relative to GPU Nuclear's May 19, 1986 submittal. The information is provided in response to our conversation with the staff on July 22, 1986.

ITEM No.	DEFICIENCY	DESCRIPTION OF CORRECTIVE ACTION	RESOLUTION
1-1	Yarway and reactor protection level instruments are not density compensated causing unnecessary alarms if density-compensated recorder is used for control.	Evaluate removing density compensation from control level instruments.	Removal of compensation from level instruments will be implemented in 13R because engineering justification from GE is not available and, therefore, implementation cannot be scheduled until then. This delay was evaluated as acceptable because compensated levels will be available on the plant computer. CRTs for the plant computer will be installed in 11R and displays developed in Cycle 11.
1-2	Core region level instruments are not used.	Evaluate making core region instruments operational when pumps are running.	Instrument was upgraded and tested to improve operator confidence. Since reading is misleading with pumps on, evaluation determined instrument should be off when pumps are on.
1-3	Need temperature indications for elevations in drywell, torus and H&V system.	Upgrade temperature instrumentation.	This item is complete. Primary readout for drywell and torus temperature used in the EOPS are available on a recorder with a digital readout on a control room front panel. These temperatures plus additional temperatures will also be available on the computer.
1-4	Synchroscope operates counter to industry standard.	Evaluate making synchroscope rotate in standard direction.	Technical and Human Factors evaluations determined modification is not necessary.
1-5	The added facades may aggravate the problem of high temperature in the spaces behind panels.	Measure temperatures if facades are installed. Correct as necessary.	Temperature survey shows no modification is necessary.
1-6	The differential pressure instrument currently provided for the containment spray system measures the difference between shellside and tubeside pressure and has no functional use. The emergency procedure calls for a shellside differential reading, which is only provided locally.	Evaluate use of present dp meter to display needed information.	The differential pressure instrument currently provided for the containment spray system is used during normal operation and cannot be used for another purpose. The reading required by the emergency procedure measures the dp across the service water baffle plate and is based on preventing degradation over long-term operation due to baffle plate deformation. Since sudden failure is not expected, periodic readings of the local dp indication are satisfactory. Furthermore, emergency procedure does not require immediate operator action. If the local indicator becomes unaccessible, performance of the heat exchanger can be assessed by control room indication of heat exchanger inlet and outlet temperature.
1-7	Displays associated with Rod Worth Minimizer are distracting to operator. Rod Worth Minimizer displays and controls are not needed on front panel.	Consider relocating the electronics. (Note that a few of the indicator lights are used and would remain.)	Rod Worth Minimizer and front controls will be resolved during 12R.

ITEM No.	DEFICIENCY	DESCRIPTION OF CORRECTIVE ACTION	RESOLUTION
1-8	Condensate return valve control lacks ability to equilibrate heat removed by condenser and decay heat from reactor.	Operators can work with present on-off control. Evaluate throttle control.	Evaluation of throttle control indicates available delta P is limited; impractical to install large size globe valve.
1-9	Condensate demineralizers have limited capacity - especially at high powers.	A fluid system modification is necessary to correct this problem fully. Individual "runout" alarms for feed pumps would help. Evaluate after completion of demineralizer mod now being made.	This is a non safety system. Since this is not a control room item it will be tracked outside DCRDR.
1-10	Operator is deprived of a rate-of-makeup indication as flow increases.	Evaluate rearranging CRD flow meter.	Evaluation with operators indicated re-arrangement not necessary. Flow indication becomes pegged only when second CRD pump is started during an emergency which is a rare occurrence. If emergency occurs, operator would know flow is above 100 GPM.
1-11	Low power feedwater control requires full-time operator attention and results in thermal cycles to reactor vessel nozzle.	Evaluate a fluid system modification (addition of Main Feed Regulator Block Valves) to correct.	Valves were repaired and operator control has improved. No further modifications are required.
1-12	Excessive reach required to operate valve to control reactor level during startup.	Consider automatic control or improve location for manual control.	Human Factors evaluation indicated modification not necessary.
1-13	Need controls for diesel generator output breakers.	Analyze, not clear control is required.	Evaluation indicated that because of diesel generator auto control design, remote operation of output breakers from control room is not required. Failure of breaker to close on sequencing would require the operator to investigate local indications, even if control room had a breaker control.
1-14	Some controls are too sensitive.	Evaluate on a case basis.	Feedwater flow control and letdown flow control were studied. Maintenance program for the feedwater valves has been upgraded and problem of control of feedwater with the HP block valves corrected. Letdown control sensitivity problem is not related to plant safety.

ITEM No.	DEFICIENCY	DESCRIPTION OF CORRECTIVE ACTION	RESOLUTION
1-15	Controls rotate opposite way expected.	Evaluate on a case basis.	Main turbine associated controls on Panels 7F, 8F/9F, and 13R were evaluated as well as the speed changer controls for the diesel generators. The deficiency concerning the main turbine governor does not affect plant safety. Human factors evaluation indicated that modification of diesel generator controls would suffer from negative transfer. New controls for ESSF diesels to be installed 12R, will incorporate a speedchanger that rotates according to industry standard.
1-16	Some variables values are not accurately measured by recorders.	Treat on a case basis.	This item was followed up as part of walk-throughs for the relabeled replacement recorders installed during last outage. During these walkthroughs, no specific instance was found where a variable was inaccurate due to a deficiency in the sensor. Quality of recorders to be improved as part of recorder replacement program, 11R.

ITEM No.	DEFICIENCY	DESCRIPTION OF CORRECTIVE ACTION	RESOLUTION
2-21	Arrangement and labeling of ventilation system controls is confusing. Mimic would help.	Relabel and consider incorporation of limited mimic. (G5)	Labeling and demarcation to be provided. Mimicing and rearrangement not required per Human Factors evaluation
2-42	Some display scale graduations and unit labels are too small and difficult to read.	Scale graduations and labels will be improved, where meter size permits. Uncorrected meters will be evaluated for replacement. (G1,G2)	Recorders have been replaced, digital displays have been added for key variables, scales are improved, none of controllers are important to safety.
2-49	Yellow color code has various meanings.	All indicators will be reviewed and changed to the color commonly used in the utility industry. (G6)	Color code will conform to consistent standard, scheduled in 11R.
2-56	Pump and valve indicator lights are less than 10% brighter than their backgrounds.	Replace old and discolored lens caps. Evaluate solutions to light variability problem.	Lens caps will be changed out on safety related systems, scheduled 11R.
2-66	Drywell vent and purge controls are located on a back panel and arranged in a confusing way with inadequate labeling.	Relabel and demarcate. Consider rearranging to provide mimic. (G1, G5)	Human Factors evaluation indicated rearrangement not necessary, relabeling will occur 12R.
2-67	Control switches for valves in cleanup system are confusingly arranged.	Relabeling will mitigate; mimicing should be evaluated. (G1) (G5)	Relabeling will be performed 11R, Human Factors evaluation indicated mimicing and rearrangement not necessary.
2-69	The condenser backwash controls are mirror imaged.	Relabel, evaluate rearrangement and/or mimicing. (G1, G5)	Relabeling will be performed 11R, Human Factors evaluation indicated mimicing and rearrangement not necessary.
2-70	Electrical system displays not well grouped.	Labeling may mitigate. Consider selected rearrangements. (G1, G5?)	Mimicing and labeling will correct, 11R.
2-71	A mimic would be useful in checking valve lineup (Condenser Backwash Controls).	Consider rearrangement or mimicing.	Relabeling will be performed 11R, Human Factors evaluation indicated mimicing and rearrangement not necessary.

ITEM No.	DEFICIENCY	DESCRIPTION OF CORRECTIVE ACTION	RESOLUTION
2-74	For certain angular positions, the needle of the GE circular electrical meters can obscure the number adjacent to the scale mark to which it is pointing.	Consider replacement of meter scales. (G2)	Diesel generator voltage and power meters and battery bus A, B and C voltage and current meters will be replaced with vertical meters in 11R. No other circular meters are required to be used during implementation of EOPS.
2-75	Differences in units exist between rate and integral displays for fluid system.	Evaluation will be done to add labeling showing tank capacities and relationship between volume and level.	BA #328030 will correct, will provide labels indicating relationship between volume and level, 11R.

ITEM No.	DEFICIENCY	DESCRIPTION OF CORRECTIVE ACTION	RESOLUTION
4-17	No display or alarm for reactor building sumps or torus room sump in control room.	Consider adding appropriate alarms or displays in control room.	The torus rooms do not have sumps as such, but the floor drains empty into Reactor Building Sump 1-6. RX Bldg. Sump alarm will be added as part of BA 402791 in Cycle 12.
4-37	Design and operation of strip chart recorders is inadequate.	Replacement of some multipoint recorders is considered. Evaluate need for trend information on remaining recorders (both multipoint and 2-pen). Provide replacement recorders or other means of displaying trend information (e.g., computer trend) where required. (G3, G9)	Some recorders replaced 10R. Replacement program extends over outages 12R and 13R. All recorders containing EOP variables were replaced in outage 10R.
4-39	Selection of time scale and recorder speed often do not allow the rate of change information the operator needs to be inferred from the recording.	Replacement of some multipoint recorders is considered. Evaluate need for trend information on remaining recorders (both multipoint and 2-pen). Provide replacement recorders or other means of displaying trend information (e.g., computer trend) where required. (G3, G9)	Some recorders replaced 10R, replacement program extends over outages 12R and 13R. All recorders containing EOP variables were replaced in outage 10R.
4-43	All the torus water level instruments utilize a common standpipe.	Investigate means for ensuring standpipe is full.	Redundant instrumentation and alarm response procedure cover this concern, no modification required.
4-45	Operator must confirm the de-energization of the 8 scram solenoids by checking the 8 indicator lights on one of the back panels. In addition, burned out indicator light bulbs can lead operator to make a serious error.	Indicator lights should be put on front panel.	Indicator lights will be put on front panel 11R, light bulbs tested at periodic intervals to avoid error.
4-58	Two-pen recorders fail as is and the absence of chart motion may not be immediately obvious.	On replacement 2-pen recorders. consider use of "power on" light. (G3)	Important parameters have redundant analog and digital displays.
4-59	Controls difficult to reach, (ATWOS and Steam line valve controls too high, others too low).	Consider relocation of steam line valve controls, for others, no corrective action recommended at this time.	Actions are infrequent and of a monitoring or test nature and not time critical; rolling step ladder available, no modification necessary.

ITEM No.	DEFICIENCY	DESCRIPTION OF CORRECTIVE ACTION	RESOLUTION
4-60	Vacuum pump controls on panel 13R are opposite the normal left-to-right sequence.	Consider rearrangement, relabeling. (G5, G1)	Human Factors evaluation indicated controls are not reversed; relabeling and demarcation program for back panels scheduled for 12R.
4-61	Certain valve controls on panel 12XR are out of normal sequence.	Consider rearrangement, relabeling. (G5, G1)	Human Factors evaluation considers rearrangement unnecessary; operator takes responsive action, does not initiate active control. Valves are not in left to right numerical sequence; however, numerical sequence has no relation to functional sequence and operator must operate based on label functional description. Seven valve controls switches are listed under this deficiency. One of the switches is used during an EOP for a deliberate action (venting the drywell) at a point in the procedure when there will be little time pressure for execution. (This is not an immediate action in the EOPs). The control is clearly labeled, occupies the upper left hand corner of the set of controls in question and is also used by the operator during routine start-up and shutdown sequences.
4-62	Control for the 3 feedwater pumps are in a horizontal array, while the controls for the 3 condensate pumps that supply them are arranged vertically	Consider rearrangement, relabeling. (G5, G1)	Human Factors evaluation with operators showed rearrangement not necessary; labeling and demarcation to be performed 11R.
4-63	MSIV test Pushbuttons are hard to operate.	Relocation of these pushbuttons (to a lower location) may improve operability. (G5)	Human factors study indicates rolling step ladder available for the convenience of operator. Operators are satisfied with location of pushbuttons. Pushbuttons will not be moved.
4-64	On panels 13R, left and right, test selection switches for the reheat stop valves and the selectors for the turbine bypass valves rotate through 360.	Consider switch replacement.	Rarely used, Human Factors evaluation showed not confusing to operators, no modification required.

ITEM No.	DEFICIENCY	DESCRIPTION OF CORRECTIVE ACTION	RESOLUTION
6-10	There is no means for adding or controlling humidity.	Evaluate installing reliable humidifier.	Humidity study indicates readings within acceptable boundaries.
6-12	Present location of GSS/GOS office is unable to prevent casual entry to control area by personnel who have no reason for being there.	Relocate GSS office to room currently occupied by Prime Computer.	Computer will be removed in 12R and room will be available to use as GSS office.